



## **Southeast Center for Agricultural Health and Injury Prevention**

**CDC/NIOSH Cooperative Agreement 5U54OH007547-13**

### **Annual Report**

**09/30/2013 through 09/29/2014**

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## SECTION I — CENTER SUMMARY

The mission of the Southeast Center for Agricultural Health and Injury Prevention (SCAHIP) is to develop and sustain an innovative program of research, education, and health promotion to prevent work-related illness and injury and to improve the health of agriculture/forestry/fishing industry workers and their families in the southeastern United States. The Southeast Center conducts and supports applied research throughout its 10-state service region: Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee, Virginia, and West Virginia.

The Center aims to:

1. Conduct research on the prevention of occupational disease and injury among agriculture/forestry/fishing workers and their families;
2. Develop, implement, and evaluate education and outreach programs to promote the safety and health of agriculture/forestry/fishing workers and their families;
3. Develop, implement, and evaluate model programs to prevent illness and injury among agriculture/forestry/fishing workers and their families; and
4. Develop links with other governmental and non-governmental bodies involved in public health and safety, especially other agricultural safety and health research centers.

## RELEVANCE

US Department of Labor trend data for the southeast United States, 2006–2010, indicate despite overall downward trends, the burden of fatal occupational injuries remained disproportionately heavy among those employed in agriculture, forestry, and commercial fishing/aquaculture (AFF) industries. Nationally, in 2012, agriculture, forestry, fishing and hunting recorded the highest fatal injury rate of any industry sector at 21.2 fatal injuries per 100,000 FTE workers. This toll is *nearly 7 times higher* than the all-industries rate of 3.2 per 100,000 FTE workers (BLS-CFOI 2012). Fatal work injuries increased among workers less than 16 years of age, rising from 10 in 2011 to 19 in 2012, and reaching its highest level since 2005. Fourteen of these fatally injured young people were employed as agricultural workers.

The agriculture, forestry, fishing and hunting sector also continues to record much higher rates of non-fatal occupational injuries than the all-industry average: 112 cases per 10,000 full-time U.S. workers in 2012 (all industries average), compared to 192 per 10,000 full-time workers in agriculture, forestry, fishing, and hunting. (BLS-IIF, 2013).

Following are the current Southeast Center projects with their associated relevance:

**Research Core: Latino Farmworkers, Work Organization, Safety and Health (J Swanberg)**

The goal of this 5-year research project is to improve the occupational safety and health of Latino workers employed on thoroughbred horse farms in Kentucky by reducing job-level and work organization-related hazards in horse production. Four aims are: 1) identify job hazards and work organization factors inherent within thoroughbred horse production; 2) describe the work and social demographic characteristics of Latino workers employed on thoroughbred horse farms, the number, type, characteristics and severity of illness, injuries and near miss incidents experienced by these workers; 3) determine how work organization factors may increase exposure to and interact with job hazards as well as occupational illness, injury and near misses among Latino workers; 4) develop and disseminate educational safety and health materials for thoroughbred horse farm owners/managers and Latino horse workers. The research is yielding promising results with a hard-to-reach employer population—thoroughbred farm representatives and a hard-to-reach vulnerable worker population that experiences significant health disparities: Latino farmworkers.

**Prevention/Intervention Core: Economics of Preventing Agricultural Injuries to Adolescents and Adult Farmers (J Mazur)**

The earlier **EOP I** project (2006–2011, CDC/NIOSH Cooperative Agreement U50 OH007547 and supplemental) developed and evaluated online versions of narrative simulation exercises and injury cost analysis tools within college courses for post-secondary students preparing for careers as high school social studies and vocational agriculture teachers and agricultural extension agents. Upon graduation, these professionals used the online exercises with hundreds of youths and adults enrolled in their respective educational programs. The **EOP II** project expands the use of digital, interactive instructional materials aimed at **promoting risk-hazard exposure reduction** among persons at-risk for farming-related injuries. The project focus is on injuries associated with farm tractor overturns, farm equipment/motor vehicle roadway collisions, head-injuries due to un-helmeted horse and ATV riding and use on farms.

**Specific Aims**

1. Target Agricultural Education programs in the Southeast to expand the cadre of pre-career professionals trained in the use of online simulations, cost tools, and digital instructional materials that emphasize the cost-effectiveness of injury prevention.
2. Expand regional, national and global access to the Economics of Prevention: Social & Individual Costs course by making it available online in interactive Web formats.
3. Develop and field test new highly engaging digital intervention products, requested by EOP1 partners, including an internet game template from the research-tested simulations and economic cost tools from EOP1 and virtual tractor inspections that motivate youth at high risk of injury to identify hazards and take preventive measures.
4. Conduct a multi-state controlled evaluation using the reliable EOP1 measures with the addition of a revised behavioral intention measure that provides greater sensitivity to impact and behavioral change regarding safe farm practices.

The uptake and institutionalization of farm safety materials into school curriculum requirements is a highly sustainable outcome of farm safety material development. Enlisting the support of local agricultural educators as safety advocates is a measurable farm safety intervention, as each teacher interacts with and influences hundreds of students in the course of a school year and extending over the course of a teaching career. Students in agricultural education classes typically become local community leaders and continue to impact the culture of farm safety in their rural communities.

**Education/Translation Core: Nurses Utilizing Research, Service, Education and Practice (NURSE-AP) (D Reed)**

The long-term goal of the NURSE-AP project is to provide farm communities with tailored, evidence-based health care and health promotion delivered by transdisciplinary teams. The intermediate goal is to advance agricultural health and safety nursing practice through emerging education and communication strategies, new clinical interventions, service learning, and community collaborations. This 5-year educational r2p project addresses barriers to optimal care created by delayed access to agricultural health and safety research, lack of evidence-based nursing practice tailored to local farm communities, and the limited number of nurses with expertise in agricultural health and safety. The NURSE-AP project includes collaborating faculty at Frontier University, Western Kentucky University (WKU), East Tennessee State University (ETSU), the University of Alabama- Tuscaloosa, and Southeastern Louisiana University (SELU).

**Specific Aims:**

1. Collect, package, and deliver state-of-the-art farm health and safety research to clinical and academic nurses and students using emerging e-learning technologies and social media.
2. Develop innovative strategies for nurse students and other students to develop expertise in agricultural health and safety.
3. Increase the capacity of nurses to develop and deliver tailored health programs for local farm constituencies.
4. Strengthen and increase a networked cadre of agricultural health nurses in practice, education, and research settings that can sustain the project post-funding. Methods include emerging pedagogy, mass communication information dissemination strategies, student internships and individualized study, faculty and clinical practice fellowships, and consultation services for agricultural nursing research and practice.
5. Disseminate health and safety education directly to farm communities.

This project has a direct impact on farmers and their families across the U.S. as noted by the new associations with multiple farm organizations and the continued work with media and other institutions. It shows the hunger that farm families have for health and safety information delivered by nurses who understand and appreciate their work. The presentations have a global reach and the new on-line course (NUR345) proved successful and influences the practice of new nurses. All these indicators point to the rapid translation of research to

practice (r2p) that this project accomplishes. The project demonstrates a further “ripple effect” impact, as many disciplines and the public look to the project for guidance, education, and resources.

**Education/Translation Core: Graduate Certificate in Agricultural Safety and Health (J Mazur)**

Service providers and clinical professionals in rural communities regularly encounter workers, patients or colleagues who live and work on farms. Current knowledge of agricultural safety and health issues is essential to serving these individuals well. However agricultural education, public health, and gerontology, higher education and professional preparation programs rarely include a focus on health and safety issues related to living and working on farms. Continuing professional education at the post-secondary level is a solution that targets rural populations and advances the *Healthy People 2010* goal to increase the Quality and Years of Healthy Life as well as NORA Strategic Goals 1-5 related to surveillance, vulnerable workers, outreach/communications and partnerships, agricultural safety and agricultural health. The Certificate in Agricultural Safety & Health, offered through the University of Kentucky College of Public Health addresses the need for the preparation of professionals to serve the needs of agricultural populations. A particular focus is working with faculty to design and prepare content in the Certificate anchor course, *Health of Agricultural Populations* (CPH 728) for offering as e-learning course modules.

**Specific Aims**

1. To develop a cadre of post-career professionals knowledgeable in the principles of agricultural safety and health at the post- baccalaureate level.
2. To implement a graduate level certificate in Agricultural Safety & Health emphasizing the novel approach of progressive inquiry learning and research-to-practice skills.

**Education/Translation Core: Native American Agricultural Safety and Health (W Sanderson)**

This project works with the Native American Tribes in Oklahoma affiliated with the Southern Plains Inter-Tribal Epidemiology Center (TEC) in Oklahoma City, OK. This upcoming year, a subcontract will be awarded to investigators with Cherokee Nation Public Health located in Tahlequah, Oklahoma to work on projects to develop risk assessment and intervention studies for agricultural health and safety problems of concern to Native American tribes. As an initial study, the tribes have identified a high prevalence of noise induced hearing loss among their rural residents. The concern is that hearing loss is associated with agricultural activities involving farm machinery, power tools, chain saws, all-terrain vehicles, and firearms. The project will involve assessment of noise exposures of rural residents from ages 12 to 60 and, based upon exposure risk, interventions will be designed to reduce noise exposure. This initial study will serve as a model to address the harmful effects of other agricultural exposures and health risks encountered by rural tribal residents.

**2014 Administrative Core Supplemental: Cost-effective Roll-over Protective Structures (CROPS) (S Vincent)**

This project replicates and extends the impact of the KY CROPS pilot project originally funded through SCAHIP feasibility funding into additional KY school districts (including 3 Appalachian districts) and two additional states (TN, NC). The project integrates NIOSH CROPS plans and installations in high school Agricultural Power Equipment & Mechanics programs. Students identify community need for CROPS installations and through a supervised project, construct and install the CROPS. Increased installations of CROPS will reduce exposure to crush and roll over injury and fatality in the targeted communities.

The multi-state project outcomes are:

1. Social media and marketing strategies to increase students' and public knowledge & awareness.
2. Teacher professional development workshops for CROPS construction and installation.
3. Implementation issues, if any, associated with the projects.
4. The number of CROPS installations pre- and post the project implementation year (24 anticipated).
5. Dissemination of findings and strategies in local communities as well as with state and national agricultural educators at the national and international conferences of NAAE and ISASH.

**Pilot Feasibility Studies and Emerging Issues Program: (W Sanderson)**

This program (1) provides initial funding to develop innovative methods of investigation and prevention/intervention in agricultural/forestry/fishing (AFF) occupational safety and health; (2) stimulates investigators in diverse disciplines to apply their expertise to AFF safety and health issues; (3) enhances external partnerships and cross-center collaboration; (4) provides support for activities designed to move the results of research into practice; and (5) provides pilot data to support successful R-01 type funding.

**Outreach Program: (J Mazur)**

The Outreach program uses purposeful, transdisciplinary approaches for print, online, and face-to-face delivery of safety and health information and training materials to farm/forestry/fish industry owners and operators, hired workers, and the membership organizations, businesses and agencies that serve them. This translation of research activity to real-world application is developed in response to priority health and safety topics identified by input from agriculture/forestry/fishing stakeholders across the 10 state region. Improved access to stakeholders including Hispanic farm workers and other vulnerable populations is a priority. Materials are developed to ensure that farm safety instruction, guidelines, and other prevention activities are culturally, linguistically, and educationally appropriate and achieve the widest possible diffusion of Center knowledge and research findings, including evidence-based "Simple Solutions", work organization strategies, and best practices for farm safety and health. A multi-Center outreach strategy is continually

developing with collaborations with the Northeast Center (Cooperstown, NY) the High Plains and Intermountain Center (Colorado State University) and Conceptual Arts, Inc., (Gainesville, FL) on expansion of the National Agricultural Safety Database ([www.nasdonline.org](http://www.nasdonline.org)) as the top online source for stakeholder access to resources and tools identified, developed, and evaluated by the NIOSH Agricultural Centers. The program with its strong ties to the University of Kentucky's instructional design program is using state-of-the-art technology to package, market, and distribute field-tested agricultural occupational safety and health materials and tools.

**Evaluation Program: (Ingram/Westneat)**

This program monitors and reports the current and ongoing progress and regional/national/international impact of all SCAHIP programs through systematic and widespread tracking in an organized, easily reportable database. A sample of activities being tracked include: classroom research subjects from EOP II and CROPS projects – not only their progress through the program but post program activities including their work placement (county specific) after program completion. This post program tracking allows us to gauge state and county-wide impact of knowledge gained in the research programs. Project-specific publication numbers, citation numbers and journal impact are also being tracked as well as oral, poster, other professional presentations. Number and type of attendees at presentations is also being monitored. These combined activities provide actual numbers to measure the continued impact of our funded programs and trace the web of regional/national/international influence.

The Evaluation core also maintains an up to date email roster of stakeholders across all 10 states and includes representation from each of the ag/forestry/fishing industries. The roster is used to conduct periodic online stakeholder surveys to solicit opinions regarding important health and safety issues across agriculture/forestry/fishing industries. This information is used to guide funding decisions for pilot projects as well as to ensure ideas for future research proposals are meeting the health/safety needs of the region. Questions about use of various forms of media are also included to assure the SCAHIP methods of disseminating information/results are appropriate and usable.

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## SECTION II — PROGRAM HIGHLIGHTS OF HIGH IMPACT

### **Research Core: Latino Farmworkers, Work Organization, Safety and Health (J Swanberg)**

Over the past year, the project has had success across all aims. Data collection representing the employer perspective (Thoroughbred Farm Review) that ended in the previous year led to data collection extending into this year. To collect comparable information from the worker perspective, advisory council members were engaged in the development of the 37-page Latino Horse Worker Survey, consisting of 462 questions related to job tasks, perceived hazards, injuries or near miss incidents, circumstances surrounding hazards and incidents, and other demographic and general health information. Lay health promoters (Promotoras) interviewers recruited participants and conducted 225 in person surveys in Spanish through a community-based sampling methodology. When results from preliminary data analysis indicated a high proportion of workers experiencing respiratory symptoms, an additional pilot study was added to the planned protocol allowing for the development and conduct of a respiratory pilot study of 80 Latino thoroughbred farm workers. Data including spirometry testing to assess lung function was collected between July-September 2014. Research findings have been shared with industry and community advisory councils, and are also being organized into a series of issue briefs to be distributed to farm representatives. A web designer is working with the project team to ensure that the project's online presence is strong and facilitates the dissemination of research findings to the largest possible audience:

<http://www.uky.edu/Centers/iwin/thoroughbred.html>. The research team attended the National Association of Community Health Centers Annual Conference to distribute health and safety information generated by SCAHIP, and also provided materials to the University of Kentucky College of Medicine Community Health Fair and Festival Latino Health Fair (a total of over 500 brochures/guides distributed).

### **Prevention/Intervention Core: Economics of Preventing Agricultural Injuries to Adolescents and Adult Farmers (J Mazur)**

During this year, data collection with the *Hazard Ridge 3-D* immersive game intervention continued. Online development progressed with the EOP II Web site <http://eoonline.org> along with additional tools for the online *Economics of Prevention: Risk and Social Costs of Ag Injury* course offered during the 4-week summer session at UK. Webcasts of materials and measures were made available online for the course in a fully online format (as a final full asynchronous pilot) available to upper level undergraduate as well as graduate students. The *Virtual Tractor Safety Walk-around Inspection* materials being used with adults at cooperative extension venues are under revision. A 'modularized' version (in five parts) and additions to the interface to include enhanced user tracking to support multiple uses of the materials to complete the extensive virtual tractor inspection content has been implemented. A final field test for three Appalachian Kentucky agricultural education classes and the Cooperative Extension will take place in fall 2014.

**Education/Translation Core: Nurses Utilizing Research, Service, Education and Practice (NURSE-AP) (D Reed)**

The impact of the project continues to exceed expectations. Farm organizations and the farm press are using information from the project and issuing requests for in-person presentations from the PI. Although nurse and other health professionals remain at the center of the project, during the past year NURSE-AP expanded to include the end users: farmers themselves. Oral presentations alone directly reached at least 1,519 persons since September 2013: 485 farmers, 840 nurses, and 194 support agricultural professionals through Drs. Reed's and Jones's presentations. National as well as state-based presentations (KY, TN, WV, PA) were made. Dr. Reed conducted a 90 minute session at the annual conference of the American Association of Occupational Health Nurses (AAOHN) in May 2014. These sessions are highly prized and Dr. Reed's was the first in the AAOHN history to highlight the agricultural industry. Dr. Jones is the current President of the KY Partnership for Farm Safety, which greatly increased the project's farm community presence and credibility. She also serves the local Mennonite community and engages nursing and medical students in her work there. Facebook page ([www.facebook.com/Agriculture.nurse](http://www.facebook.com/Agriculture.nurse)) uptake continues to increase with 115 likes (up from 74 in 2013). New participants include farmers and agriculture support personnel who use the content in community presentations and electronic newsletters and/or Facebook pages. The most popular NURSE-AP post to date was the *Safety Christmas List for Farmers* (274 hits).

**Education/Translation Core: Native American Agricultural Safety and Health (W Sanderson)**

A subcontract is being awarded in year 3 to investigators with Cherokee Nation Public Health located in Tahlequah, Oklahoma to work on projects to develop risk assessment and intervention studies for agricultural health and safety problems of concern to Native American tribes. Drs. Mannino and Sanderson met with tribe officials in Oklahoma in March 2014. As an initial study, the tribes have identified a high prevalence of noise induced hearing loss among their rural residents. The concern is that hearing loss is associated with agricultural activities involving farm machinery, power tools, chain saws, all-terrain vehicles, and firearms. The project will involve assessment of noise exposures of rural residents from ages 12 to 60 and, based upon exposure risk, interventions will be designed to reduce noise exposure. This initial study will serve as a model to address the harmful effects of other agricultural exposures and health risks encountered by rural tribal residents.

**2014 Administrative Core Supplemental: Cost-effective Roll-over Protective Structures (S Vincent)**

Highlights of the past year included 25 CROPS installations in 8 rural Kentucky counties (5 new counties including 3 Appalachian sites), involving 200 agricultural education high school students. The resulting CROPS products were prominently displayed in the local press in these communities. The project expanded this year into Tennessee and North Carolina. As of fall 2014 a total of 4 schools in each of the 3 states will participate. Pre-test data, plans and curriculum materials have been delivered to all 12 sites as of September 22, 2014. In July 2014, Drs. Vincent and Mazur met with the eight KY CROPS teachers and Drs. Dave Hard and Tony McKenzie from NIOSH to exchange experiences and inform the NIOSH creators and testers of the CROPS plans of the KY CROPS project. Important information such as cross-installation

information (additional tractors for the CROPS retrofit plans online) was relayed. Teachers explicitly requested a formal CROPS curriculum for future implementations. The *CROPS PROJECT TEACHER'S GUIDE* has been developed and binders are now available for participating schools past and current. A CROPS project website is under development.

### **Education/Translation Core: Graduate Certificate in Agricultural Safety and Health (J Mazur)**

Dr. Mazur assisted by Ms. Ellen Bloomfield, M.S. an experienced instructional designer and educator (and doctoral candidate in Instructional Systems Design at the University of Kentucky) completed the instructional design work including analyses of general content resulting in the development support materials including alignment of course objectives (in CPH 728) with the disciplinary certification standards used for certification of the College of Public Health. Additional development documents were also distributed, including the Subject Matter Expert (SME) content form to assist Mazur and Bloomfield with instructional design tasks. Drs. Sanderson and Purschwitz are co-teaching the course and have revised the syllabus from previous offerings. This rigorous course emphasizes inquiry and problem solving using sound research methods to investigate a variety of agricultural health and safety issues. Coursework includes on-site classes, guest lectures from national experts in various agricultural health and safety topics (using teleconferencing tools), farm visits and collaborative group investigations that employ scientific field research methods. The 'course shell' available on BlackBoard, the Learning Management System, was structured by the weekly content module, with objectives, activities and assessments and course content from the Fall 2014 offering of CPH 728 posted as the course evolves through the weekly classes. Weekly digital video taping of on-site and teleconferenced guest lectures through the use of the Adobe Connect Telecourse delivery system is ongoing beginning in August 2014 (beginning of the fall semester at UK).

### **Outreach (J Mazur)**

#### Outreach via Integration of Agricultural Safety Materials in Public Schools: Curriculum Integration.

We continue to work with three large agricultural education programs in Kentucky: Elkhorn Career & Technology Center, the Jessamine County Career & Technology Center, and the Locust Trace Agricultural Education High School in Lexington. These are now using the *Virtual Tractor Safety Walk-Around Inspection CD ROM* lessons as required curriculum materials in their agricultural mechanics classes. These outcomes result from Dr. Mazur's ongoing work with the Kentucky Association of Agricultural Educators (KAAE). The Kentucky Department of Education/Career & Vocational Division is pursuing the design of a pilot project that will use the National Agricultural Safety Database (NASD) tool for performance assessments for students in high school agricultural mechanics classes that emphasize farm safety units as part of new state required curriculum standards. The field test of the Virtual Tractor Safety Walk-Around Inspection and Checklist occurred in three Kentucky Agricultural Education high school programs (Whitley, Laurel and McCreary Counties) in May 2014.

Outreach to Hispanic farm workers with the help of Kentucky Children's Health Insurance Program Coordinator Victoria Davis (KCHIP). Mrs. Davis serves on the board of the Migrant Network Coalition and assists in strategic and tactical planning at its monthly board meetings.

Mrs. Davis engaged Latino/Latina stakeholders at numerous community events; *e.g.*, Festival Latino and Health Fair, Sep 2014; YMCA Back to School rallies, 2014 Aug; Centro de Amistad/Annual Latino Festival, 2014 Jun; Día de la Mujer Latina, 9th Annual Health Fiesta, 2013 Oct 19.

The SCAHIP exhibit at the National FFA Convention held in Louisville, KY, in October 2013 attracted contacts with more than 500 FFA members. Many of these future farmers subsequently visited Center social media (*i.e.*, Facebook and Twitter) and hundreds of contacts, including high school vocational agricultural instructors, were added to the outreach mailing list.

USAgCenters YouTube Channel. Three digital documentary submissions to the YouTube Channel from SCAHIP remain uploaded on the Channel. These digital documentaries are products from the Economics of Prevention graduate online course, funded through the Economics of Prevention I and II projects (EOP1 & EOP2), which also now have dual outreach functions. The URL for the YouTube site is <http://www.youtube.com/UsAgCenters>

Social Media: Stakeholder survey data from 220 respondents confirmed the use of webpages, facebook, twitter, YouTube platforms for receiving health and safety information.

Southeast Center electronic outreach at a glance:



<http://www.mc.uky.edu/scahip/>



<http://www.eoponline.org>



<https://www.facebook.com/580178002007732>



<https://www.facebook.com/Agriculture.nurse>



<http://www.uky.edu/Centers/iwin/thoroughbred.html>

<https://www.twitter.com/SCAHIP>



<http://www.youtube.com/watch?v=VfYlX4eJ0fk>



<http://www.youtube.com?USagCenters> (*cross-center collaboration*)

### **Evaluation (Ingram/Westneat)**

An email roster of stakeholders across all 10 states in the SCAHIP region and representing each of the agriculture/forestry/fishing industries was created. An online stakeholder survey was developed and distributed to the roster. Data collection is continuing with over 220 responses to date. Respondents provided rich open-ended data on what they deem to be the topic areas of concern in health and safety across the industries of agriculture, forestry and fishing. This information provides vital feedback to the outreach core as well as guides pilot project funding and future proposal development. In addition, valuable information about smart phone and access to and interest in social media has been collected on the survey, supporting the Center's

social media development plans. Tracking of students, publications, citations, presentations and outreach activities is also ongoing.

**Pilot Feasibility/Emerging Issues Program (W Sanderson)**

<b>Investigator</b>	<b>Institution</b>	<b>Project</b>
<b>Richards, Stephanie</b>	East Carolina University	Environmental Impacts on Effectiveness of Permethrin-Treated Clothing Used by Outdoor Workers Such as Foresters to Prevent Mosquito Bites
<b>Kearney, Greg</b>	East Carolina University	Sun Protection Behaviors Among Hispanic Farm Workers
<b>Fullen, Mark</b>	West Virginia University	West Virginia Logger Hazard Awareness and Injury Risk Perception
<b>Hunsucker, Sharon</b>	University of Kentucky	Effects of obesity on the work and safety of farmers

Pilot Project abstracts are shown in Appendix A.

**APPENDIX A – PILOT PROJECTS FUNDED 2013-2014**

Project Title: Environmental Impacts on Effectiveness of Permethrin-Treated Clothing Used by Outdoor Workers Such as Foresters to Prevent Mosquito Bites

PI: Stephanie Richards, East Carolina University, Department of Health Education and Promotion, Environmental Health Science

Summary of Project:

The long-term implications of biological hazards to outdoor workers such as foresters and park rangers are not understood. Biological hazards such as exposure to ticks and mosquitoes can affect health. A previous study found reduced tick repellency in permethrin-treated clothing during the second year of wear. We evaluated the extent to which fabric type (100% cotton denim jeans, 100% polyester work shirt, 35% cotton/65% polyester United States Forester uniform work shirt), light exposure (0 or 100%), temperature (18°C, 32°C), and number of washes (0, 3, 12, 36) affected mosquito (*Aedes albopictus*) knockdown 2 hours post-exposure (hpe), mosquito mortality 24 hpe, and permethrin content in clothing. Reviewers of the NIOSH AFF program noted that “agricultural and forestry workers are the veritable ‘canary in the mineshaft’ when zoonotic disease outbreaks occur, given their proximity to animal and avian hosts.” (Gunderson & Bean, et al., 2013). NIOSH has been urged to “encourage targeted surveillance” and identify “worksite practice(s) that could reduce or eliminate known sources of zoonotic disease, while also encouraging analysis into zoonotic workforce risk.”

Project Title: Sun Protection Behaviors Among Hispanic Farm Workers

PI: Greg Kearney, East Carolina University, Brody School of Medicine/ Department of Public Health

Summary of Project:

Skin cancer rates among Hispanic farmworkers are relatively unknown and studies of their sun protection behavior are limited. This study aims to (1) Evaluate sun protection attitude, knowledge and behaviors of Hispanic migrant and seasonal farm workers; and (2) Use data and information from Aim 1 to develop a culturally appropriate educational sun safety tool in English and Spanish to inform Hispanic farm workers of the dangers of excessive UVR sun exposure. We plan to measure the sun safety perceptions and behaviors of farm workers in two eastern NC counties (Halifax and Greene Counties, n = 125). We plan to provide a crude estimate of (pre)cancerous skin conditions among outdoor farm workers; document (by using an electronic, time stamped, UVR dosimeter wristwatch) the extent and duration of UVR exposure among 4 subjects for approximately 8 weeks; and develop a culturally appropriate educational intervention. This study is consistent with NIOSH strategic goals regarding disease and injury surveillance among vulnerable populations. It may also help to improve our knowledge of change in worksite exposures resulting from introduction of new worker organization and deployment patterns, field and plant technologies, and climate change. (Cf. Gunderson and Bean, et al., 2013).

Project Title: West Virginia Logger Hazard Awareness and Injury Risk Perception

PI: M. Fullen, West Virginia University, Safety & Health Extension

Summary of project:

This project aims to develop a survey tool and collect pilot data on hazard awareness and injury risk perception data among West Virginia loggers and small company owners, as well as differences in risk perception between these groups. Aims include: (1) Develop a survey instrument designed to assess the level of hazard awareness among loggers and owner/operators; (2) Explore the level of hazard awareness and injury risk perception among loggers and logger owner/operators; (3) Identify differences in hazard awareness and injury risk perception between the two sub-samples, including a survey (n=100) and oral interviews among a sub-sample (n=15); and (4) Use the survey results to identify gaps in hazard awareness/injury risk perception among loggers and owner/operators in order to inform the development of future targeted interventions. According to the U.S. Census Bureau, nearly 83% of all logging employers employed from 1 to 10 workers (Scott, 2004). Thus, this pilot study targets workers whose safety typically eludes OSHA oversight. The project addresses two NORA II priority areas for AgFF: Strategic Goal 1: Improve surveillance within the Agriculture, Forestry, and Fishing Sector to describe: the nature, extent, and economic burden of occupational illnesses, injuries, and fatalities; occupational hazards; and worker populations at risk for adverse health outcomes. Strategic Goal 6: Reduce the number, rate and severity of traumatic injuries and deaths involving hazards of forestry.

Project Title: Effects of obesity on the work and safety of farmers

PI: Sharon Hunsucker, University of Kentucky College of Nursing

Summary of project:

This project seeks to describe the relationship between obesity and work ability, work productivity, and work-related injuries in farmers. This objective is in keeping with NORA II strategic goal 5: "To improve the health and well-being of agricultural workers by reducing occupational and contributing factors to acute and chronic illness and disease (NORA 2008). The project team will conduct anthropometric measurements and administer the work ability index (WAI) survey and work limitations questionnaire (WLQ) among farmers attending the National Farm Machinery Show, North American Livestock Expo, and other events (n > 394). The WAI and WLQ were developed by the Finnish Institute of Occupational Health and Tufts Medical Center, respectively, and have established reliability.

## Appendix B – SCAHIP OUTPUTS October 2013 through September 2014

### Publications:

Clouser, J. M. (2013). *En Mis Propias Palabras, In My Own Words: A qualitative analysis of Latino horse workers depictions of their work and health*. Master of Public Health, University of Kentucky, Lexington, KY

Swanberg, J. E., Clouser, J. M., Browning, S. R., Westneat, S., & Webster, M. K. (2013). Occupational Health among Latino Horse and Crop Workers in Kentucky: The Role of Work Organization Factors. *Journal of Agromedicine*, 18(4), 312-325. doi: 10.1080/1059924X.2013.826604

Swanberg, J., Clouser, J. M., Westneat, S. C., Marsh, M. W., & Reed, D. B. (2013). Occupational Injuries on Thoroughbred Horse Farms: A Description of Latino and Non-Latino Workers' Experiences. *International Journal of Environmental Research in Public Health*, 10(12), 6500-6516. doi: 10.3390/ijerph10126500.

Jones, M.S., Main, M.E. & Garrett-Wright, D. (2013). A collaborative educational innovation in an old order Mennonite community. *Journal of the National AHEC Organization*, XXIX (1), 24-27.

Coles, J. (March, 2014). Appreciative inquiry: an emerging approach to delivering quality nursing care. *Kentucky Nurse*, p7. (D. Reed, mentor).

Reed, D.B., Allen-Bryant, K., Hunsucker, S. (2014). Worker Demographics and Implications for the OEHN. In Moore, R. & Moore, P.V. *Core Curriculum for Occupational and Environmental Health Nursing*. Pensacola, FL: AAOHN. This chapter includes a specific extended section on agricultural workers.

Schneider, M.A. & Mazur, J. (2014). The Use of a Digital Game-Based Safety Program for ATV Operational Knowledge of Youthful Riders. *Proceedings of the 19<sup>th</sup> International Conference on Computer Games: AI, Animation, Mobile, Educational & Serious Games 28<sup>th</sup>-30<sup>th</sup> July 2014* Louisville, KY

Main, E. & Jones, M.S. (2014). Linking community partners to increase tetanus immunizations among farmers. *Workplace Health and Safety*, 1-6. Posted August 11, 2014.

Mazur, JM., Vincent, SA, Watson, J, Westneat, S. CROPS Assembly & Installation In High School Agricultural Mechanics Classes: A feasibility study. Accepted September 2014. *J. Agromedicine*.

### Publications Under Review:

Swanberg, J., Clouser, J. M., Bush, A. M., Westneat, S., & Reed, D. B. (2014). Work Organization and Safety Practices on Thoroughbred Farms. (under review).



Clouser, J.M., Swanberg, J.S., Bundy, H. (2014). Safety Perceptions and PPE Provision of Thoroughbred Farm Representatives (under review).

Mazur JM, Westneat, S. Barriers to agricultural safety with adolescent & adult farmer populations: Exploring apprenticeships of observation. In preparation. J Agromedicine.

Swanberg, J., Mannino, D., Wenqi, G., Clouser, J. & Flunker, J. (in process). Respiratory Symptoms among Latino Horse Workers: Does Job Quality Matter?

**Oral Presentations (including number in audience where available):**

Swanberg, J., Clouser, J. M., Westneat, S., Marsh, M. K., & Reed, D. (2013). What's Perceived, What's Experienced, What's Reported: A mixed methods description of injuries on horse breeding farms. Paper presented at the American Public Health Association Annual Conference, Boston, MA.

Swanberg, J., Clouser, J. M., Bush, A. M., Westneat, S., & Reed, D. B. (2014). Work Organization and Safety Practices on Thoroughbred Farms. Technical paper presented at the International Society for Agricultural Safety and Health, Omaha, Nebraska.

Kearney, G. *Sun Protection Behavior among Latino Migrant Farmworkers in Eastern North Carolina*. International Society for Agriculture Safety and Health (ISASH) conference, June, 2014.

Reed, D.B. (2013). *Pathways Along the Journey*. ETSU Sigma Theta Tau Research Day [600 nursing students from four universities and their faculty (some participated via teleconference); also videoed and archived]. Invited keynote presentation. October 13, 2013, Johnson City, TN. (600)

Reed, D.B. (2013). *Older farmers: Assessing Risk*. WV Farm Bureau Annual Meeting. November 8, 2013. Sutton, West Virginia. Invited presentation. (70)

Jones, M.S. (2013). *A collaborative partnership to improve health and education nurses in an old order Mennonite community*. The 42<sup>nd</sup> Biennial Sigma Theta Tau International Convention, Indianapolis, IN. November 16, 2013.

Reed, D.B. (2013). *Farmer Health and Safety 101*. 2<sup>nd</sup> Annual Empowering Women Veterans Conference (part of the National Farmer Veteran Coalition), November 15, 2013, Louisville, KY. Invited presentation. (120)

Vincent SK, Welch B, Mazur J, Watson J, Maxwell L, Alston A. Human learning and transformational play: Using electronic gaming and agricultural education to reduce fatalities among teenage youth. Conference of the Southern Agricultural Economics Association. Dallas, TX. 2014 Feb 10-13.

Reed, D.B. (2014). *Farm safety: Mitigating the risk*. Presented to the Kentucky Farm Bureau Women's Leadership Conference, March 22, 2014. 130 persons attended two 60 minute sessions (highest rated session at conference).

Reed, D.B. (2014). *Aging and farming: Understanding "normal"* (data based). 2014 ArgAbility National Training Workshop, Lexington, KY, April 2, 2014. Invited presentation. 184 attendees.

Reed, D.B. (2014). *Aging, farming, and ten tips*. Pennsylvania Farm Bureau District 14 Annual Meeting. Erie, PA. April 5, 2014. (165 attendees)

Reed, D.B. *Health and safety of America's agricultural workforce*. 90 minute invited session. American Association of Occupational Health Nurses (AAOHN) Annual Conference, Dallas, TX. May 2014.

Reed, D.B. & Claunch, D.T. *Protecting ourselves from harm: voices of aging farmers*. International Society for Agriculture Safety and Health (ISASH) conference, June, 2014. (60)

Mazur, JM, & Schneider, M. Do Farm Safety Games Reflect Prevention Practice? A Review Through the Haddon Matrix Lens, Paper presented at the Annual meeting of the International Society for Agricultural Safety and Health (ISASH). Omaha, Nebraska; 2014 Jun 23-27.

Mazur, J. Hazard Ridge: Immersive Economics of Prevention Safety Game. Presentation at the North American Agricultural Health & Safety Summit. Minneapolis, MN. 2013 Sept 26 [ASHCA].

Reed, D.B. (2014). *Occupational asthma and asthma in agriculture*. Invited (professional service). KY Asthma Partnership, Lexington, KY. 50 participants, interdisciplinary. July 2014.

**NOTE:** First ever session at AAOHN on agriculture

#### **Community Presentations/Material Distribution:**

Presentation on Ag Safety to KY Farm Bureau Safety Coordinators, September 25, 2014

Latino Farmworkers, Work Organization, Safety and Health (J Swanberg) project's Industry Advisory Council includes members of the Kentucky Thoroughbred Farm Managers Club, Kentucky Thoroughbred Association, farm owners, and human resource personnel. The Community Advisory Council includes members of the Kentucky Migrant Farm-workers with Disabilities Employment Partnership, Blue Grass Farms Charities, and the Migrant Network Coalition, et al. Activity with both councils this past year included: 9 advisory council meetings/consultations; 3 formal industry endorsements; 46 community council meetings or consultations; 2 community meetings attended by research team members; 7 other community/industry meetings. Over 500 community resource brochures and occupational safety training guides were distributed throughout the central Kentucky area.

Farm organizations that have welcomed NURSE AP presentations and/or taken up NURSE AP articles and materials have included Farm Bureau, the Farmer Veteran Coalition, Southeast Farm Press, Bluegrass Equine Journal, and Modern Farmer. Dr. Reed and her colleagues estimate that, during the period under review, NURSE AP outreach activities have directly reached more than 700 farmers and more than 700 health professionals, the majority of them nurses.

**Poster Presentations:**

Jones, M.S. (Nov., 2013). *Promoting safe practices on farms through the artistic expressions of youth*. The 42<sup>nd</sup> Biennial Sigma Theta Tau International Convention. Indianapolis, IN. November 16, 2013.

Coles, J. (April, 2014). *Appreciative inquiry: an emerging approach to delivering quality nursing care*. National Student Nurse 62<sup>nd</sup> Annual Convention, Nashville, TN (D. Reed, mentor).

Jones, M.S., Reed, D.B., & Honaker, A. (2014). *An agricultural health nursing course designed for distance education*. Poster presentation. 2014 Kentucky League for Nursing (KLN) Conference, Louisville, KY, May, 2014.

Reed, D. B. (2104). *Voices of reality: Developing consensus on injury prevention of aging farmers*. American Association of Occupational Health Nurses (AAOHN). May 2014.

Jones, M.S., Reed, D.B., & Honaker, A. (2014). *An agricultural health nursing course designed for distance education*. Poster presentation. International Society for Agricultural Safety and Health (ISASH) conference, Omaha, NE. June 2014.

Mazur, JM, Nelson, J, Olion B. NASD 2.0: Designing & Testing An Interactive Online Training Environment. Poster presented at the International Society of Agricultural Safety & Health (ISASH). Omaha, Nebraska; 2014, Jun 23-27.

Jones, M.S., Reed, D.B., & Honaker, A. (2014). *An agricultural health nursing course designed for distance education*. Poster presentation. Kentucky Rural Health Association (KRHA) Conference, Bowling Green, KY, September, 2014.

**Pending Posters:**

Jones, M.S., Reed, D.B., & Honaker, A. (2014). *An agricultural health nursing course designed for distance education*. Poster presentation. Kentucky Nurses Association (KNA) Convention, Louisville, KY, October, 2014.

**Conference presence/booths: SCAHIP staff, demonstrations and materials will be at each:**

Future farmers and the educators who lead them. The SCAHIP exhibit at the National FFA Convention held in Louisville, KY, in October 2013 attracted contacts with more than 500 FFA members. Many of these future farmers subsequently visited Center social media (i.e.,

Facebook and Twitter) and hundreds of contacts, including high school vocational agricultural instructors, were added to the outreach mailing list.

Participation in the **Governor's Safety Conference** [www.kshn.net](http://www.kshn.net) 2014 May 6 – 9, Louisville, KY

ISASH 2014, Omaha, NE – SCAHIP booth

Ag Field Day, Mercer County, KY exhibit, September 18, 2014

**Pending booth/conference presence:**

SCAHIP booths at the National FFA Conference, Louisville, KY Oct 29-Nov 1, 2014 and the American Public Health Association Conference, New Orleans, Nov 15-19, 2014.

Participation in the "Farmworker Housing Quality and Health: A Transdisciplinary Conference," organized by the Center for Worker Health, Wake Forest School of Medicine, Nov 15-17, 2014.

Participation in NOIRS, May 2015; ISASH, June 2015; National Association of Agricultural Educators (NAAE), Nov 18-22, 2015

**Courses Developed/Offered:**

Fall 2013 – Western Kentucky University WKU NUR345 On-line Agricultural Nursing course officially approved by Western Kentucky University. This is the only course we are aware of that focuses specifically on nursing and agricultural health and safety and uses on-line technology. Fall 2013 the 9 students who completed the course rated the offering as highly informational and applicable to practice. Students from KY, IA, and TN have participated. As part of the course students produce and disseminate health information for farm clients. 24 students are currently enrolled in Fall 2014.

March 2014 - CE offering – Reed, D.B. (2014). *Clinical considerations in caring for aging farmers: Unique challenges and opportunities*. East Tennessee State University's 18<sup>th</sup> Annual Primary Care Conference. Johnson City, TN. March 27, 2014. 135 attendees; 1.5 CEs.

Fall 2014 – CE Offering: Stress and Farming– Jones, M.S. Western Kentucky University. Complete 1 hour CE module on psychological issues in farming and offer on-line. Unique format using Storyline software. Target Date: October 1, 2014. A total of 204 WKU students will evaluate the CE module (64 enrolled in mental health, 82 enrolled in health assessment, and 58 enrolled in adult health at MSN level). Also plan to send CE module to peers for outside evaluation. The program will be offered through the Southcentral AHEC for credit.

**Student Involvement:**

Feb 2014 – UK College of Nursing PhD student focusing on obesity and farm work injury and productivity began data collection for her dissertation on *Obesity and Farm Injury Risks* (Sharon Hunsucker, ARNP; also faculty at Frontier University).

March 2014 – UK DrPH student defended her capstone: *A cross sectional study of the predictors of poor self-reported health status and retirement in Kentucky and South Carolina farmers age 50 and older*, based on Dr. Reed's R01 data set from Sustained Work Indicators of Farmers ages 50 and Over (Ellen Lycan).

January 2014 to Present – Dr. Reed serving on dissertation committee for PhD candidate at the University of Alabama- Tuscaloosa. Topic: *Investigating the effectiveness of safety day boosters in reducing soda consumption among rural youth: An application and test of the theory of planned behavior*. (Shannon Murphy).

Spring/ Summer 2014 – Agricultural Education Master's student works on Outreach and the CROPS project for the Center. This includes visits to high schools with ag programs and preparation for conference booths and materials.

Spring 2014 – NURSE-AP research intern (Coles) was the only University of Kentucky nursing student to have a poster selected for the National Student Nurse Association Annual Convention. She has also published her work (see publications section).

September 2014 – New UK College of Nursing research intern on board (Eastman). Will be involved in NURSE-AP facebook and recently funded R01 Farm Theater project which introduces a novel strategy for changing safety behavior in agricultural communities.

#### **Other SCAHIP Faculty Achievements:**

SCAHIP Director David M. Mannino was awarded the European Respiratory Society ((ERS) Fellow award.

September 2014 – Dr. Reed secured a 4-year R01 grant from CDC entitled *Farm Theater: A Novel Safety Strategy Approach for Agricultural Communities*. In this project she will include nurses in two states, a graduate student, and a research intern.

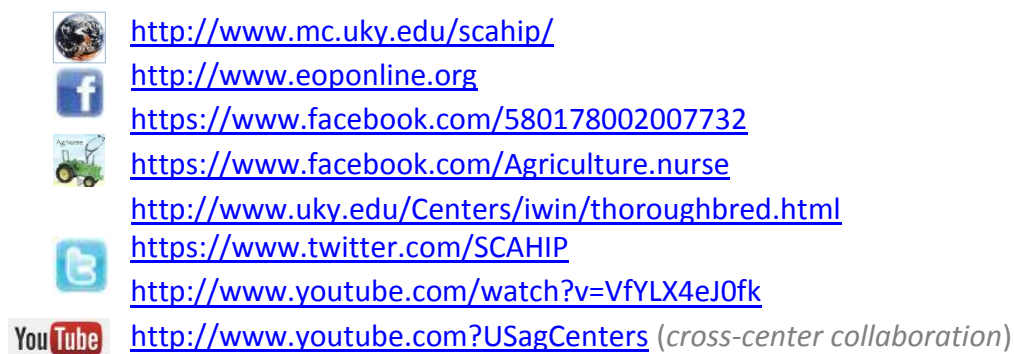
Dr. Reed continues her work with the Ohio Valley Appalachian Regional Geriatric Education Center (OVAR GEC) emphasizing aging farmer issues.

Editors of the *Journal of Agromedicine* named Dr. Reed to an Honorable Mention for her outstanding service to the journal and its authors. In addition she was recognized as an AAOHN Fellow.

#### **Dissemination of products through social media:**

During the past year, the Center continued to expand its online/social media presence and online outreach activity. A stakeholder survey, currently underway with over 220 responses from all states in our region, supports this effort showing 75% of the respondents having smartphones and half indicating interest in receiving health and safety information via Facebook; YouTube, text messaging and app platforms.

SCAHIP sites now include:



Drs. Mazur and Purschwitz continue working with Jeff Nelson and Chris Knack of Conceptual Arts, Inc., to refine the design of online training tools and resources for the [National Agricultural Safety Database](#) (NASD). A very informative and productive conference call occurred on 3/14/14, facilitated by Dr. Yoder (Nebraska Center) regarding their NASD funding and how all centers interested might collaborate on populating the NASD information archive with current material to update those offerings. An updated and robust compendium of didactic instructional or prevention materials on the NASD site will complement and enhance the NASD 2.0 site that SCAHIP is developing.

### Examples of Uptake & Use of Southeast Center Information and Products

John Bobb, of BM Quarterhorses, contacted the Center on April 10, 2014, after hearing of the cost-effective ROPS (CROPS) project.

Bopp S. Healthful Hints. Thrive: Growing Together. 2014 Feb. First quarter newsletter publication of [Syngenta, Inc.](#) Farm safety and health article quoting SCAHIP's Dr. Deborah B. Reed and other leaders in agricultural occupational safety and health education. Syngenta, Inc., informational at [www.syngenta-us.com](http://www.syngenta-us.com) Bopp article accessed online at [http://www.farmassist.com/Promo/Thrive/community/staying\\_healthy.html](http://www.farmassist.com/Promo/Thrive/community/staying_healthy.html) [2014 Feb 4].

Annette M. Sudyka, CTPM; Texas Parks & Wildlife HOH Fisheries Science Center, and John Paret of Texas Parks & Wildlife Possum Kingdom State Fish Hatchery requested copies of two Southeast Center Simple Solutions booklets: Durborow, Myers, et al. [Safety for Ponds](#) and Durborow, Myers, et al., [Safety for Raceways](#). 2014 Jan. Copies of these booklets had been distributed to state fisheries throughout the Southeast in 2011–2012.